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Extensor pollicis longus tendon compression as the etiology of a true aneurysm of the radial artery in the anatomical snuff box

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True aneurysms of the radial artery are rare. The natural history of these aneurysms is not well understood. We report the case of a true aneurysm of the radial artery located in the anatomical snuffbox in a 65-year-old man with no antecedent trauma which was treated with resection and cephalic vein interposition graft. We discuss the treatment options as well as review previous literature on radial artery aneurysms and suggest compression by the extensor pollicis longus tendon on the radial artery as a contributing factor to the formation of these aneurysms. (J Vasc Surg Cases 2016;2:152-4.)

True aneurysms of the radial artery are rare. The natural history of these aneurysms is not well understood. We present a patient with a true radial artery aneurysm (RAA) located in the anatomical snuffbox that was treated with resection and cephalic vein interposition graft. The patient described in this case report consented to publication of this article.

CASE REPORT

A 65-year-old male patient presented with a pulsatile mass in the anatomical snuffbox of the left hand. The patient denied previous trauma, instrumentation, connective tissue disease, or hand ischemia. He had no other history of aneurysmal disease. Physical examination revealed a 1.5-cm × 1.5-cm soft mass with a thrill. Duplex ultrasound imaging of the left radial artery demonstrated an RAA with thrombus (Fig 1). There was kinking of the radial artery proximal to the aneurysm in the area where the artery was crossed by the extensor pollicis longus (EPL) tendon.

An angiogram of the left upper extremity (Fig 2) showed the aneurysm was located several centimeters distal to the takeoff of the superficial palmar arch branch of the radial artery. The deep and superficial arches of the hand were complete. Kinking of the radial artery proximal to the aneurysm was again noted.

On the basis of aneurysm diameter more than three times that of the native radial artery, the presence of thrombus within the sac with risk of distal embolization, and the patient's desire to have the aneurysm treated, the patient was offered surgical repair of the aneurysm. The aneurysm was exposed, resected, and repaired with a reversed cephalic vein interposition graft harvested from the same incision (Fig 3). Pathology demonstrated a true aneurysm containing well-organized thrombus within the aneurysm sac.

The postoperative period was uneventful, and the patient had no digit ischemia or neuropathy. Duplex ultrasound imaging at the follow-up visit showed the repair was patent, and the patient had no complaints.

DISCUSSION

The etiology of arterial aneurysms is complex and multifactorial. Predisposing factors such as smoking, family history, and advanced age contribute to the formation of the most commonly found aneurysms, including abdominal aortic, iliac, and popliteal artery aneurysms. A less common group of aneurysms, including ulnar or subclavian artery aneurysms, often occurs in the setting of repetitive motion injury to an artery at a location where a segment of artery is fixed at a vulnerable and superficial flexion point. True RAAs may be included in this second group of aneurysms.

Most RAAs reported in the literature are pseudoaneurysms occurring secondary to trauma. Case reports indicate true RAAs are rare and occur almost exclusively and idiopathically in the anatomical snuffbox.[1-5] One case report attributed a true RAA to repetitive occupational trauma from use of tailor's scissors,[6] and one report described synchronous aneurysms in a patient with Marfan disease.[7] None of the patients presented with symptoms of rupture or embolization.

The anatomical snuffbox is a triangular depression found on the lateral aspect of the dorsum of the hand.

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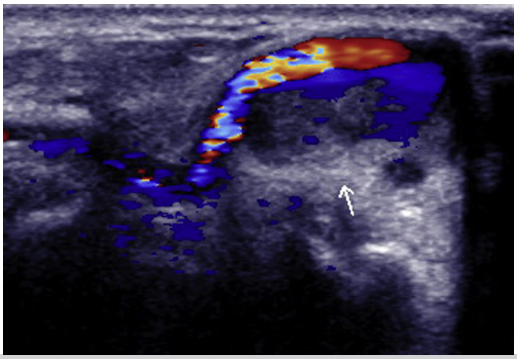

Fig 1. Ultrasound image of the radial artery aneurysm (RAA) demonstrates kinking of the radial artery proximal to the aneurysm and substantial thrombus (*white arrow*) in the aneurysm sac.

Fig 2. Angiogram of the left hand demonstrates kinking of the radial artery proximal to the aneurysm.

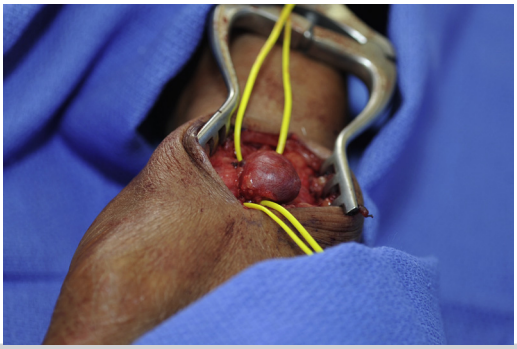

Fig 3. Operative exposure of the radial artery aneurysm (RAA).

The radial artery lies on the bony floor of the anatomical snuffbox and runs in an oblique manner, crossing under the EPL tendon. The flexion point where the EPL tendon overlies the radial artery likely represents an area of compression on the artery. Case reports describe radial artery thrombosis in the anatomical snuffbox without aneurysm attributed to compression of the radial artery by the EPL tendon[8,9] (and personal correspondence from M. Nelles and D. Frankel).

Operative management of RAAs is aneurysm excision with radial artery ligation or arterial reconstruction. The arterial anatomy in the hand is redundant. In most individuals, the ulnar artery is the larger branch of the brachial artery and is the dominant artery supplying the hand through the superficial palmar arch.[10] Radial artery ligation is usually well tolerated, as typified in trauma,[11] distal radial artery ligation for steal syndrome,[12] and radial artery harvest for bypass.[13,14] However, spontaneous or traumatic radial artery thrombosis with acute thumb and finger ischemia has been described with morbid outcomes.[15-17] In the setting of RAA with possible suboptimal thumb and second finger perfusion after radial artery ligation, as demonstrated on preoperative imaging, a short-segment vein bypass likely has excellent durability, provides ideal perfusion to the hand, and eliminates the risk of hand or thumb ischemia.

CONCLUSIONS

We have reported a patient with RAA treated with aneurysm resection and a vein interposition graft after careful assessment of hand perfusion with duplex ultrasound imaging and angiogram. RAAs occur almost exclusively in the anatomical snuffbox, and compression of the radial artery by the EPL tendon may contribute to the formation of these aneurysms.

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